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Ozette Lake
Clallam County, Washington

(U.S.) National Eutrophication Survey, Las Vegas, NV

Prepared for

Environmental Monitoring and Support Lab, Las Vegas, NV

Dec 77

PB 288008

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NATIONAL EUTROPHICATION SURVEY

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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REPORT
ON
OZETTE LAKE
CLALLAM COUNTY
WASHINGTON
EPA REGION X
WORKING PAPER No. 873

WITH THE COOPERATION OF THE
WASHINGTON DEPARTMENT OF ECOLOGY
AND THE
WASHINGTON NATIONAL GUARD

DECEMBER, 1977

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point source discharge reduction and nonpoint source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's freshwater lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by the U.S. Environmental Protection Agency and to augment plans implementation by the states.

ACKNOWLEDGMENTS

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Washington Department of Ecology for professional involvement, to the Washington National Guard for conducting the tributary sampling phase of the Survey, and to those Washington wastewater treatment plant operators who provided effluent samples and flow data.

Ms. Barbara Blau, Lake Restoration Program, and the staff of the Washington Department of Ecology, Lake Restoration Program, provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports and provided critiques most useful in the preparation of this Working Paper Series.

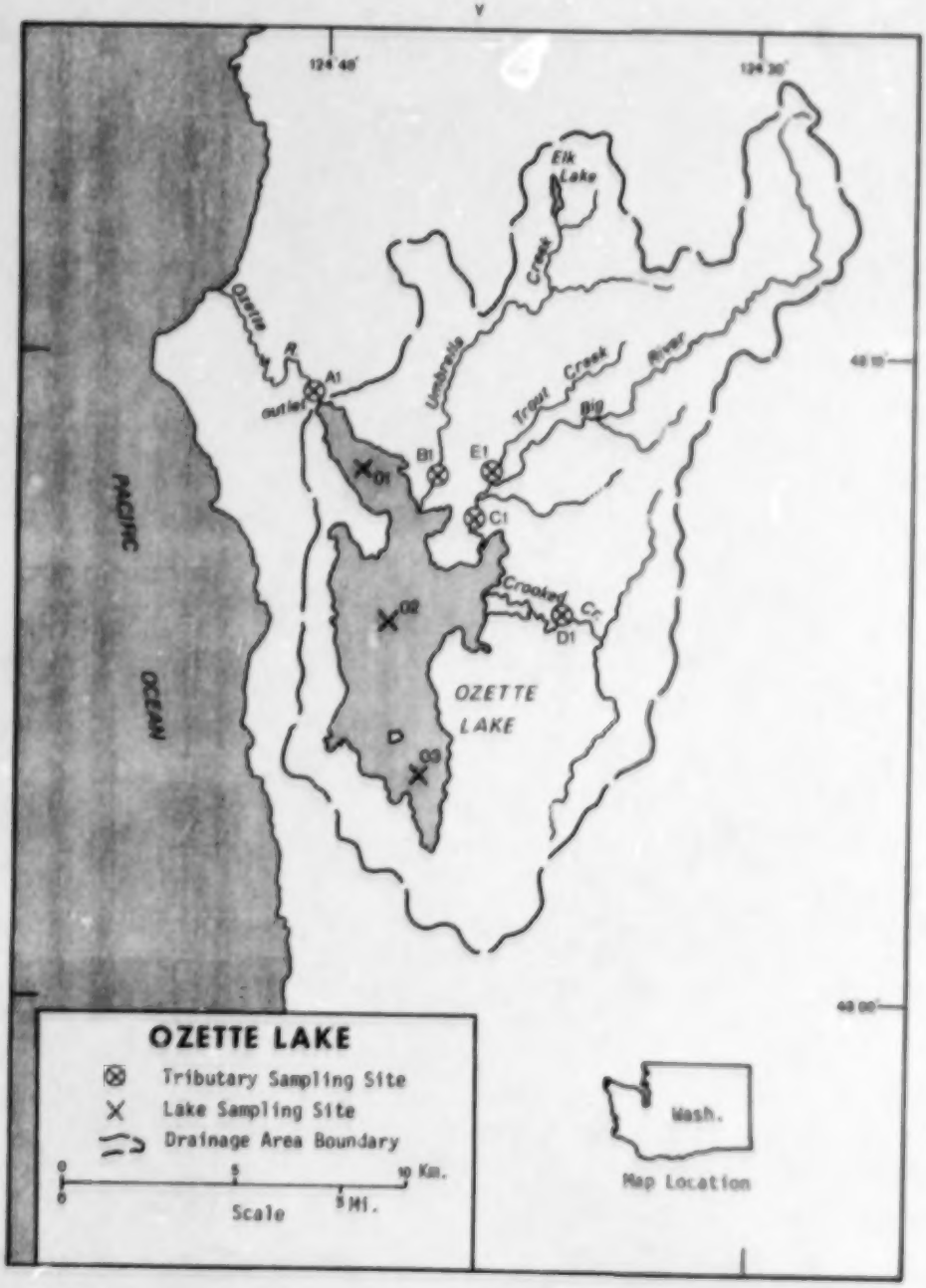
Major General Howard S. McGee, Adjutant General of Washington, and Project Officer Colonel Clinton C. Johnson, who directed the volunteer efforts of the Washington National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF WASHINGTON

LAKE NAME	COUNTY
American Lake	Pierce
Banks Lake	Grant, Douglas
Chelan Lake	Chelan
Diamond Lake	Pend Oreille
Green Lake	King
Keechelus Lake	Kittitas
Mayfield Lake	Lewis
Medical Lake	Spokane
Moses Lake	Grant
Ozette Lake	Clallam
Sammamish Lake	King
Lake Whatcom	Whatcom
Lower Granite Reservoir	Garfield, Whatcom


124°40'
124°30'
Elk Lake
Creek
Umbrella
Trout Creek
Big River
Ozette R.
outlet
A1
B1
E1
C1
D1
C2
Crooked
PACIFIC
OCEAN
OZETTE
LAKE
D
OZETTE LAKE
Tributary Sampling Site
Lake Sampling Site
Drainage Area Boundary
0
5
10 Km.
0
5 Mi.
Scale
Wash.
Map Location

OZETTE LAKE

STORET NO. 5310

I. INTRODUCTION

Ozette Lake was included in the National Eutrophication Survey as a water body of interest to the Washington State Department of Ecology. Because flow data were not provided by the U.S. Geological Survey, nutrient loads can not be calculated, and this report relates to lake sampling data only. However, the tributary sampling data are included in Appendix C for the record.

Ozette Lake is less than one mile inland from the northern Washington coast and is the third largest natural lake in the state (Wolcott, 1973). The watershed is entirely forested and relatively undeveloped. Ozette Lake is used exclusively for recreation, but only one resort and four cabins have been built on the lakeshore. The lake offers a cold water sport fisheries that includes most salmonid species (Millenbach, 1975).

Lee (1969) reported an orthograde oxygen profile during thermal stratification which suggests the lake is oligotrophic. However, he noted that the water is coffee colored due to seepage from surrounding peat bogs, and thus transparency is reduced.

II. CONCLUSIONS

A. Trophic Condition*:

Survey data indicate that Ozette Lake is oligo-mesotrophic. It ranked third in overall trophic quality among the 13 Washington lakes and reservoirs sampled in 1975 when compared using a combi-

* Trophic assessment is based on the levels of nutrients, dissolved oxygen, and chlorophyll a; phytoplankton kinds and numbers; and transparency (Allum et al., 1977).

nation of six water quality parameters*. Three of the water bodies had less median total phosphorus, six had less and two had the same median dissolved orthophosphorus, seven had less median inorganic nitrogen, one had less mean chlorophyll a, and nine had greater mean Secchi disc transparency. No significant depression of dissolved oxygen occurred at any of the sampling times.

B. Rate-Limiting Nutrient:

The algal assay results indicate the lake was phosphorus limited at the time the sample was collected (10/29/75). The lake data indicate phosphorus limitation in October but nitrogen limitation in March and July.

* See Appendix A.

III. LAKE AND DRAINAGE BASIN CHARACTERISTICS†

A. Morphometry††:

1. Surface area: 29.54 kilometers^2.
2. Mean depth: 39.6 meters.
3. Maximum depth: 97.5 meters.
4. Volume: 1,169.784 x 10^6 m^3.

B. Precipitation*:

1. Year of sampling: 251.5 centimeters.
2. Mean annual: 268.1 centimeters.

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† Table of metric equivalents--Appendix B.
†† Wolcott, 1973.
* See Working Paper No. 175, "...Survey Methods, 1973-1976".

IV. WATER QUALITY SUMMARY

Ozette Lake was sampled three times during the open-water season of 1975 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from a number of depths at three stations on the lake (see map, page v). During each visit, a single depth-integrated (4.6 m to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the last visit, a single 18.9-liter depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll *a* analysis. The maximum depths sampled were 30.8 meters at station 1, 56.7 meters at station 2, and 67.1 meters at station 3.

The sampling results are presented in full in Appendix C and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR OZETTE LAKE
STORET CODE 5310

PARAMETER	1ST SAMPLING (3/31/75) 3 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (7/18/75) 3 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (10/29/75) 3 SITES RANGE	MEAN	MEDIAN
TEMP (C)	6.4 - 7.1	6.6	6.5	6.0 - 17.1	11.5	10.8	7.8 - 12.2	10.7	11.5
DISS OXY (MG/L)	11.2 - 11.8	11.5	11.4	7.8 - 10.4	9.5	9.4	8.8 - 10.5	9.5	9.6
CNDCTVY (MCROMO)	26. - 29.	28.	28.	25. - 39.	33.	32.	26. - 33.	30.	29.
PH (STAND UNITS)	6.8 - 7.7	7.0	6.9	6.7 - 7.8	7.1	6.9	6.3 - 6.7	6.5	6.5
TOT ALK (MG/L)	10. - 14.	11.	10.	10. - 10.	10.	10.	10. - 10.	10.	10.
TOT P (MG/L)	0.010 - 0.072	0.015	0.011	0.007 - 0.020	0.009	0.008	0.009 - 0.077	0.014	0.011
ORTHO P (MG/L)	0.002 - 0.020	0.009	0.006	0.010 - 0.020	0.013	0.012	0.002 - 0.009	0.004	0.002
NO2+NO3 (MG/L)	0.090 - 0.120	0.092	0.090	0.020 - 0.100	0.056	0.045	0.050 - 0.100	0.071	0.060
AMMONIA (MG/L)	0.020 - 0.030	0.022	0.020	0.020 - 0.040	0.030	0.030	0.020 - 0.030	0.021	0.020
KJEL N (MG/L)	0.200 - 0.300	0.211	0.200	0.200 - 0.400	0.259	0.300	0.200 - 0.200	0.200	0.200
INORG N (MG/L)	0.110 - 0.150	0.114	0.110	0.050 - 0.130	0.087	0.080	0.080 - 0.120	0.091	0.080
TOTAL N (MG/L)	0.290 - 0.420	0.303	0.290	0.220 - 0.420	0.315	0.320	0.250 - 0.300	0.271	0.260
CHLRPYL A (UG/L)	1.0 - 1.1	1.1	1.1	1.5 - 2.2	1.8	1.8	0.7 - 1.2	1.0	1.0
SECCHI (METERS)	2.7 - 3.4	3.0	2.9	2.9 - 3.0	2.9	2.9	1.2 - 1.5	1.4	1.5

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units per ml
03/31/75	1. Chroomonas sp.	120
	2. Cyclotella sp.	60
	3. Melosira sp.	60
	4. Cryptomonas sp.	30
	Total	270
07/18/75	1. Melosira sp.	719
	2. Flagellates	332
	3. Pennate diatoms	166
	4. Cryptomonas sp.	111
	5. Ankistrodesmus sp.	111
	Other genera	165
	Total	1604
10/29/75	1. Stephanodiscus sp.	66
	2. Chroomonas sp.	66
	3. Synedra sp.	22
	4. Closterium sp.	22
	5. Oscillatoria sp.	22
	Other genera	24
	Total	222

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (µg/l)
03/31/75	1	1.1
	2	1.1
	3	1.0
07/18/75	1	2.2
	2	1.5
	3	-
10/29/75	1	1.2
	2	1.0
	3	0.7

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.005	0.135	0.1
0.050 P	0.055	0.135	6.8
0.050 P + 1.0 N	0.055	1.135	25.4
1.0 N	0.005	1.135	0.1

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates that the potential primary productivity of Ozette Lake was low at the time the sample was collected (10/29/75). Also the increase in yield with the addition of orthophosphorus alone indicates that the lake was limited by phosphorus at that time. Note that the addition of nitrogen alone resulted in a yield no greater than that of the control.

The lake data indicate phosphorus limitation in October as well; i.e., the mean inorganic nitrogen/orthophosphorus ratio was 23/1. However nitrogen limitation is indicated in March and July; i.e., the mean N/P ratios were 13/1 or less, and nitrogen limitation would be expected (N/P ratios of 14/1 or greater generally indicate phosphorus limitation).

V. MEAN NUTRIENT CONCENTRATIONS IN UNGAGED STREAMS:

Tributary	Mean Total P Conc. (mg/l)	Mean Total N Conc. (mg/l)
Ozette River (outlet)	0.015	0.344
Umbrella Creek	0.015	0.236
Big River	0.022	0.433
Crooked Creek	0.015	0.282
Trout Creek	0.041	0.454

VI. LITERATURE REVIEWED

Allum, M.O., R.E. Glessner, and J.H. Gakstatter, 1977. An evaluation of the National Eutrophication Survey data. Working Paper No. 900, Corvallis, Env. Res. Lab., Corvallis, OR.

Lee, Ronald A., 1969. Limnological studies of selected Washington State lakes. Techn. Rept. No. 69-2, WN State Water Poll. Contr. Comm., Olympia.

Millenbach, Cliff, 1975. Personal communication. WN State Dept. of Game, Olympia.

Wolcott, Ernest E., 1973. Lakes of Washington. Volume I-Western Washington. Water Supply Bull. #14, WN State Dept. of Ecology, Olympia.

VII. APPENDICES

APPENDIX A

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
5301	AMERICAN LAKE	0.027	0.105	343.000	4.822	15.000	0.007
5302	BANKS LAKE	0.021	0.040	364.533	7.373	10.800	0.007
5303	CHELAN LAKE	0.005	0.070	111.900	0.905	6.400	0.003
5304	DIAMOND LAKE	0.014	0.060	303.667	14.537	14.200	0.010
5305	GREEN LAKE	0.027	0.050	415.000	2.983	10.600	0.009
5306	KEECHELUS LAKE	0.007	0.040	280.250	1.400	9.200	0.002
5307	MAYFIELD LAKE	0.014	0.100	402.000	4.250	10.600	0.007
5308	MEDICAL LAKE	0.275	0.225	401.714	16.425	15.000	0.166
5309	MOSES LAKE	0.115	0.150	463.600	29.060	14.600	0.038
5310	OZETTE LAKE	0.010	0.110	403.333	1.225	7.200	0.009
5311	SAMMAMISH LAKE	0.015	0.210	374.000	7.290	14.600	0.006
5312	WHATCOM LAKE	0.009	0.320	288.000	3.422	10.800	0.009
5313	LOWER GRANITE RESERVOIR	0.033	0.150	435.500	4.875	7.200	0.022

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
5301	AMERICAN LAKE	29 (3)	50 (6)	67 (8)	50 (6)	4 (0)	58 (7)	258
5302	BANKS LAKE	42 (5)	100 (12)	58 (7)	25 (3)	46 (5)	71 (8)	342
5303	CHELAN LAKE	100 (12)	67 (8)	100 (12)	100 (12)	100 (12)	92 (11)	559
5304	DIAMOND LAKE	62 (7)	75 (9)	75 (9)	17 (2)	33 (4)	25 (3)	287
5305	GREEN LAKE	29 (3)	83 (10)	17 (2)	75 (9)	62 (7)	46 (5)	312
5306	KEECHELUS LAKE	92 (11)	92 (11)	92 (11)	83 (10)	75 (9)	100 (12)	534
5307	MAYFIELD LAKE	62 (7)	58 (7)	33 (4)	58 (7)	62 (7)	71 (8)	344
5308	MEDICAL LAKE	0 (0)	8 (1)	42 (5)	8 (1)	4 (0)	0 (0)	62
5309	MOSES LAKE	8 (1)	29 (3)	0 (0)	0 (0)	21 (2)	8 (1)	66
5310	OZETTE LAKE	75 (9)	42 (5)	25 (3)	92 (11)	87 (10)	33 (4)	354
5311	SAMMAMISH LAKE	50 (6)	17 (2)	50 (6)	33 (4)	21 (2)	83 (10)	254
5312	WHATCOM LAKE	83 (10)	0 (0)	83 (10)	67 (8)	46 (5)	46 (5)	325
5313	LOWER GRANITE RESERVOIR	17 (2)	29 (3)	8 (1)	42 (5)	87 (10)	17 (2)	200

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	5303	CHELAN LAKE	559
2	5306	KEECHELUS LAKE	534
3	5310	OZETTE LAKE	354
4	5307	MAYFIELD LAKE	344
5	5302	BANKS LAKE	342
6	5312	WHATCOM LAKE	325
7	5305	GREEN LAKE	312
8	5304	DIAMOND LAKE	287
9	5301	AMERICAN LAKE	258
10	5311	SAMMAMISH LAKE	254
11	5313	LOWER GRANITE RESERVOIR	200
12	5309	MOSES LAKE	66
13	5308	MEDICAL LAKE	62

APPENDIX B

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 - cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX C

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 77/03/07

531001
48 08 15.0 124 39 00.0 3
OZETTE LAKE
53009 WASHINGTON
131291

/TYPA/AMBNT/LAKE

11EPALES 04001002
0093 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/31	11	15 0000	6.5	11.4	132	26	7.70	10	0.020	0.200K	0.100	0.005
	11	15 0005	6.5	11.2		26	7.45	10K	0.020	0.200K	0.090	0.014K
	11	15 0015	6.5	11.4		28	7.25	10K	0.020K	0.200K	0.090	0.006
	11	15 0050	6.5			28	7.10	10K	0.020K	0.200K	0.090	0.006
	11	15 0088	6.5	11.3		29	7.00	10K	0.020	0.200K	0.090	0.018K
75/07/18	12	00 0000	17.0	9.0	120	37	7.25	10K	0.030	0.300	0.020	0.010J
	12	00 0005	16.9	9.2		37	7.35	10K	0.030	0.300	0.020K	0.010K
	12	00 0017	16.8	9.0		39	7.40	10K	0.030	0.400	0.020K	0.012K
	12	00 0040	9.3	9.4		29	6.90	10K	0.040	0.300	0.070	0.012K
	12	00 0065	7.0	9.6		25	6.70	10K	0.040	0.300	0.090	0.020J
	12	00 0090	6.6	9.0		25	7.00	10K	0.020K	0.300	0.050	0.014K
75/10/29	12	40 0000	12.2	9.6	60	32	6.70	10K	0.030	0.200K	0.050	0.002
	12	40 0005	12.2	9.4		32	6.60	10K	0.020	0.200K	0.060	0.002K
	12	40 0015	12.2	9.8		29	6.70	10K	0.020	0.200K	0.060	0.003
	12	40 0040	12.1	9.6		33	6.60	10K	0.020K	0.200K	0.060	0.002
	12	40 0075	11.5	9.4		28	6.60	10K	0.020K	0.200K	0.060	0.005
	12	40 0101	8.8	8.8		26	6.50	10K	0.020K	0.200K	0.100	0.008

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 77/03/07

531001
48 08 15.0 124 39 00.0 3
OZETTE LAKE
53009 WASHINGTON
131291

/TYPA/AMBNT/LAKE

11EPALES 04001002
0093 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/31	11 15	0000	0.012	1.1	
	11 15	0005	0.011		
	11 15	0015	0.010		
	11 15	0050	0.012		
	11 15	0088	0.012		
75/07/18	12 00	0000	0.014	2.2	
	12 00	0005	0.008		
	12 00	0017	0.008		
	12 00	0040	0.008		
	12 00	0065	0.020		
	12 00	0090	0.011		
75/10/29	12 40	0000	0.011	1.2	
	12 40	0005	0.011		
	12 40	0015	0.011		
	12 40	0040	0.011		
	12 40	0075	0.013		
	12 40	0101	0.016		

STORET RETRIEVAL DATE 77/03/07

531002
48 05 47.0 124 38 20.0 3
OZETTE LAKE
53009 WASHINGTON
131291

/TYPA/AMBNT/LAKE

11EPALES 04001002
0190 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/31	12 00	0000	6.6	11.8	108	28	6.90	10K	0.020	0.200K	0.090	0.014K
	12 00	0005	6.5	11.6		28	6.90	10K	0.020	0.200K	0.090	0.011K
	12 00	0015	6.5	11.6		28	6.90	10K	0.020K	0.200K	0.090	0.003
	12 00	0050	6.4	11.4		28	6.85	10K	0.020	0.200K	0.090	0.003
	12 00	0085	6.4	11.2		28	6.85	10K	0.020K	0.200K	0.090	0.011K
	12 00	0135	6.4	11.4		28	6.85	10K	0.030	0.200K	0.090	0.020K
	12 00	0186	6.4	11.4		28	6.90	10K	0.030	0.200	0.090	0.020J
75/07/18	11 25	0000	17.0	9.0	114	39	7.80	10K	0.030	0.300	0.030	0.010K
	11 25	0005	16.8	9.0		37	7.60	10K	0.030	0.300	0.020K	0.012K
	11 25	0015	16.7	8.8		39	7.30	10K	0.030	0.300	0.020K	0.010K
	11 25	0035	12.4	7.8		33	7.00	10K	0.040	0.300	0.040	0.011K
	11 25	0055	8.3	9.8		31	6.85	10K	0.030	0.200	0.080	0.016K
	11 25	0090	6.9	10.0		29	6.80	10K	0.020	0.200	0.100	0.012K
	11 25	0135	6.4	10.4		29	6.70	10K	0.030	0.200	0.100	0.013K
	11 25	0175	6.1	10.0		29	6.80	10K	0.030	0.200	0.100	0.013K
75/10/29	13 05	0000	11.8	9.8	60	29	6.50	10K	0.020K	0.200K	0.060	0.002K
	13 05	0005	11.8	8.8		31	6.50	10K	0.020K	0.200K	0.060	0.002
	13 05	0015	11.8	9.6		28	6.55	10K	0.020K	0.200K	0.060	0.002
	13 05	0050	11.8	9.8		30	6.55	10K	0.020	0.200K	0.060	0.005
	13 05	0080	11.8	9.6		28	6.50	10K	0.020K	0.200K	0.060	0.009

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 77/03/07

531002
48 05 47.0 124 38 20.0 3
OZETTE LAKE
53009 WASHINGTON
131291

/TYPA/AMBNT/LAKE

11EPALES 04001002
0190 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/31	12 00	0000	0.011	1.1	
	12 00	0005	0.010		
	12 00	0015	0.010		
	12 00	0050	0.010		
	12 00	0085	0.010		
	12 00	0135	0.014		
	12 00	0186	0.072		
75/07/18	11 25	0000	0.008	1.5	
	11 25	0005	0.008		
	11 25	0015	0.008		
	11 25	0035	0.007		
	11 25	0055	0.007		
	11 25	0090	0.007		
	11 25	0135	0.007		
	11 25	0175	0.007		
75/10/29	13 05	0000	0.011	1.0	
	13 05	0005	0.010		
	13 05	0015	0.009		
	13 05	0050	0.010		
	13 05	0080	0.077		

STORET RETRIEVAL DATE 77/03/07

531003
48 03 20.0 124 37 33.0 3
OZETTE LAKE
53009 WASHINGTON
131291

/TYPA/AMBNT/LAKE

11EPALES 04001002
0999 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/03/31	12 35	0000	7.1	11.8	114	28	6.85	13	0.030	0.300	0.120	0.004
	12 35	0005	7.0	11.6		28	6.85	12	0.020K	0.200	0.090	0.003
	12 35	0015	6.8	11.4		28	6.80	14	0.020	0.300	0.090	0.003
	12 35	0065	6.6	11.6		28	6.90	14	0.020K	0.200	0.090	0.004
	12 35	0120	6.5	11.6		28	6.85	12	0.020	0.200K	0.090	0.013K
	12 35	0170	6.5	11.4		28	6.85	10K	0.020K	0.200	0.090	0.003
	12 35	0220	6.5	11.4		28	6.80	10K	0.020	0.200K	0.090	0.002
75/07/18	10 50	0000	17.1	9.0	114	36	7.30	10K	0.040	0.300	0.020	0.013J
	10 50	0005	17.0	8.8		37	7.20	10K	0.030	0.200	0.020K	0.017K
	10 50	0015	15.0	10.0		37	7.05	10K	0.040	0.200	0.020K	0.013K
	10 50	0035	12.6	9.4		33	6.90	10K	0.040	0.300	0.040	0.012K
	10 50	0055	8.6	9.8		31	6.90	10K	0.030	0.200	0.080	0.013K
	10 50	0090	6.9	10.2		29	6.80	10K	0.020	0.200	0.100	0.012K
	10 50	0135	6.2	10.4		29	6.90	10K	0.020	0.200	0.100	0.011K
	10 50	0175	6.0	10.4		29	6.90	10K	0.020	0.200	0.100	0.010K
75/10/29	13 30	0000	10.8	10.5	48	33	6.50	10K	0.020K	0.200K	0.080	0.005
	13 30	0005	10.7	9.6		31	6.40	10K	0.020K	0.200K	0.080	0.008
	13 30	0015	10.6	9.8		33	6.40	10K	0.020K	0.200K	0.070	0.002
	13 30	0045	10.6	9.4		30	6.40	10K	0.020K	0.200K	0.070	0.005
	13 30	0075	9.6	9.2		29	6.40	10K	0.020K	0.200K	0.080	0.002
	13 30	0125	8.1	9.2		26	6.35	10K	0.020K	0.200K	0.090	0.002
	13 30	0175	8.0	9.4		27	6.30	10K	0.020K	0.200K	0.090	0.004
	13 30	0220	7.8	9.4		28	6.30	10K	0.020K	0.200K	0.090	0.002K

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 77/03/07

531003
48 03 20.0 124 37 33.0 3
OZETTE LAKE
53009 WASHINGTON
131291

11EPALES 04001002
0999 FEET DEPTH CLASS 00

/TYPA/AMBNT/LAKE

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/03/31	12 35	0000	0.015	1.0	
	12 35	0005	0.010		
	12 35	0015	0.011		
	12 35	0065	0.013		
	12 35	0120	0.012		
	12 35	0170	0.010		
	12 35	0220	0.011		
75/07/18	10 50	0000	0.014		
	10 50	0005	0.010		
	10 50	0015	0.009		
	10 50	0035	0.008		
	10 50	0055	0.008		
	10 50	0090	0.007		
	10 50	0135	0.007		
	10 50	0175	0.008		
75/10/29	13 30	0000	0.011	0.7	
	13 30	0005	0.011		
	13 30	0015	0.013		
	13 30	0045	0.010		
	13 30	0075	0.010		
	13 30	0125	0.009		
	13 30	0175	0.010		
	13 30	0220	0.010		

STORET RETRIEVAL DATE 77/03/07

5310A1
48 09 15.0 124 40 10.0 4
OZETTE RIVER
53 15 OZETTE
O/OZETTE LAKE 131291
BANK SMPL FROM END OF OZETTE RD IN OZETT
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/21	13 10		0.016	0.400	0.030	0.005K	0.005K
74/10/05	09 45		0.020	0.200	0.010	0.005K	0.010
74/11/03	11 45			1.000	0.072	0.010	0.010
74/12/15	11 15		0.072	0.200	0.035	0.005	0.010K
75/01/11	12 19		0.060	0.300	0.032	0.005K	0.015
75/02/09	11 03		0.168	0.900	0.032	0.008	0.030
75/03/08	12 15		0.080	0.100	0.008K	0.008K	0.020
75/03/23	11 15		0.075	0.100	0.030	0.005	0.020
75/05/17	11 25		0.050	0.250	0.040	0.005K	0.010K
75/08/02	12 55		0.005	0.100	0.055	0.005K	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 77/03/07

5310d1
48 08 10.0 124 37 20.0 4
UMBRELLA CREEK
53 15 OZETTE
T/OZETTE LAKE 131291
HROG ON OZETTE ROAD 2.6 MI SE OF OZETTE
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/21	13 35		0.016	0.200	0.020	0.005	0.005
74/10/05	10 55		0.008	0.100K	0.005K	0.005K	0.010
74/11/03	12 30		0.008	0.200	0.016	0.008	0.010K
74/12/15	11 40		0.088	0.200	0.030	0.005	0.010
75/01/11	12 38		0.088	0.300	0.024	0.010	0.020
75/02/09	11 15		0.064	0.400	0.016	0.008	0.030
75/03/08	13 00		0.048	0.100	0.008K	0.008K	0.010
75/03/23	11 30		0.045	0.100	0.025	0.005	0.020
75/08/02	13 10		0.005	0.150	0.050	0.005K	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 77/03/07

5310C1
48 07 35.0 124 36 15.0 4
BIG RIVER
53 15 OZETTE
T/OZETTE LAKE 131291
DRT RD BRDG 3.5 MI SE OF OZETTE
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/21	13 50		0.020	0.300	0.020	0.020	0.025
74/10/05	11 05		0.012	0.200	0.005K	0.010	0.030
74/11/03	12 40		0.008	0.400	0.016	0.016	0.020
74/12/15	11 49		0.216	0.650	0.040	0.010	0.015
75/01/11	12 47		0.216	0.300	0.016	0.010	0.030
75/02/09	11 20		0.152	0.350	0.016	0.008K	0.015
75/03/23	11 40		0.135	0.300	0.060	0.010	0.025
75/05/17	11 53		0.030	0.400	0.045	0.010	0.010
75/08/02	13 16		0.005	0.200	0.055	0.010	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 77/03/07

531001
48 05 50.0 124 34 15.0 4
CROOKED CREEK
53 15 OZETTE
T/OZETTE LAKE 131291
BANK SMPL .1 MI S DRT RD 5.8 M SE OZETTE
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/21	14	10	0.016	0.300	0.025	0.015	0.020
74/10/05	11	20	0.012	0.300	0.005	0.005	0.025
74/11/03	13	00	0.008	0.300	0.024	0.008	0.010K
74/12/15	11	25	0.080	0.300	0.050	0.005	0.010
75/01/11	12	57	0.080	0.100K	0.016	0.005	0.020
75/02/09	11	35	0.080	0.200	0.016	0.008K	0.020
75/03/08	14	00	0.048	0.100	0.008K	0.008K	0.010
75/03/22	11	45	0.060	0.400	0.045	0.005	0.020
75/05/17	12	05	0.005	0.350	0.035	0.005	0.010K
75/08/02	13	30	0.005	0.080	0.080	0.005K	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 77/03/07

5310E1
48 36 00.0 124 08 10.0 4
TROUT CREEK
53 15 OZETTE
T/OZETTE LAKE
AT OZETTE RD XING 4 MI ESE OF OZETTE
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/21	14	25	0.024	0.400	0.020	0.025	0.060
74/10/05	11	40	0.024	0.600	0.015	0.020	0.065
74/11/03			0.008	0.400	0.024	0.016	0.040
74/12/15	12	40	0.120	0.400	0.080	0.010	0.020
75/01/11	13	15	0.120	0.300	0.024	0.010	0.020
75/02/09	11	45	0.088	0.400	0.024	0.008	0.020
75/03/08	13	15	0.064	0.100	0.008K	0.008	0.030
75/03/23	12	00	0.060	0.500	0.050	0.005	0.030
75/05/17	12	17	0.028	0.400	0.028	0.020	0.040
75/08/02	13	40	0.005	0.500	0.085	0.025	0.090

K VALUE KNOWN TO BE
LESS THAN INDICATED